CLAIMS

1. A means for controlling the gain of a optical amplifier comprising a source for generating a gain control signal, an optical amplifier for receiving one or more optical input signal channels at a first end and means for providing the gain control signal to the optical amplifier at the other end; in which the source is arranged to generate the gain control signal at a power level that produces stimulated Brillouin scattering (SBS) in the optical amplifier.

2. The means according to claim 1 comprising control means for identifying a change in the input signal and for varying the gain control signal power level to compensate for the identified change.

3. The means according to claim 2 in which the control means comprises monitor means for monitoring the power of the input signal and for varying the gain control signal power level to compensate for changes in the monitored power.

4. The means according to claim 2 or 3 in which the control means comprises means for obtaining information on the input signal channel or channels from an optical supervisory channel or pilot tone.

5. The means according to any above claim in which the gain control signal falls within the gain bandwidth of the optical amplifier.

6. The means according to any above claim further comprising means for monitoring the power level of the gain control signal.

7. The means according to any above claim in which the amplifier is a Raman amplifier.

8. The means according to claim 7 in which the amplifier is a distributed Raman amplifier

9. The means according to any one of claims 1 to 6 in which the amplifier is a rare earth doped fibre amplifier.

10. An optical amplifier comprising the means according to any one of claims 1 to 9.

11. An optical communications system comprising the means according to any one of claims 1 to 9 or the amplifier according to claim 10.

12. A method of controlling the gain of an optical amplifier comprising the steps of introducing one or more optical input signal channels into a first end of the optical amplifier, generating a gain control signal and introducing the gain control signal at the other end of the optical amplifier, in which the gain control signal is

generated at a power level that produces stimulated Brillouin scattering (SBS) in the optical amplifier.

13. . The method according to claim 12 including the steps of identifying a change in the input signal and varying the gain control signal power level to compensate for the identified change.

14. The method according to claim 13 including the step of monitoring the power of the input signal and varying the gain control signal power to compensate for a change in the monitored power.

15. The method according to claim 13 or 14 including obtaining information on the signal channels from an optical supervisory channel or pilot tone.

16. The method according to any of claims 12 to 15 in which the gain control signal falls within the gain bandwidth of the optical amplifier.

17. The method according to any of claims 12 to 16 further including the step of monitoring the power level of the gain control signal.

18. The method according to any of claims 12 to 17 in which the amplifier is a Raman amplifier.

19. The method according to claims 18 in which the amplifier is a distributed Raman amplifier

20. The method according to any of claims 12 to 17 in which the amplifier is a rare earth doped fibre amplifier.